

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



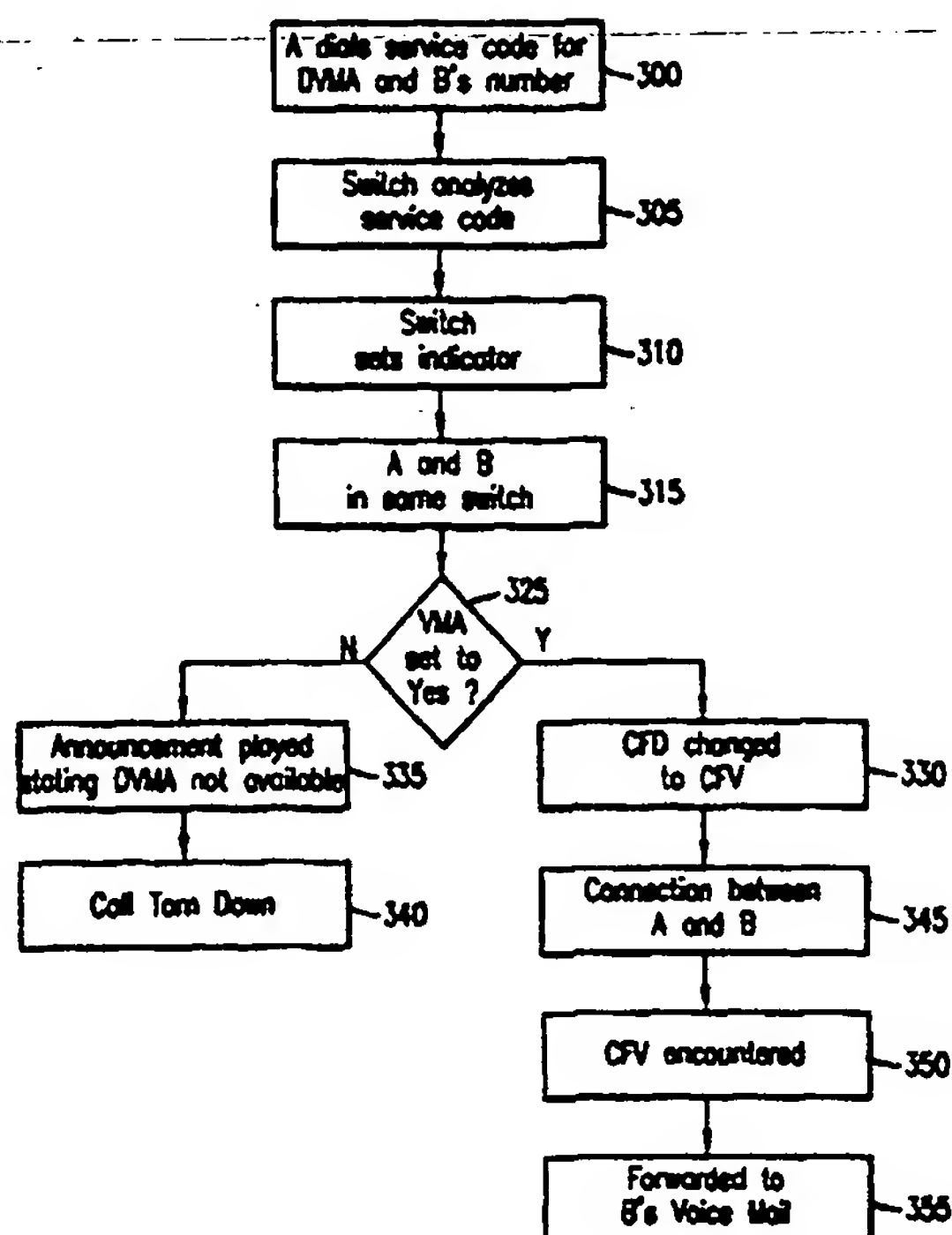
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>H04M 3/50</b>	<b>A1</b>	(11) International Publication Number: <b>WO 99/27700</b> (43) International Publication Date: 3 June 1999 (03.06.99)
(21) International Application Number: PCT/US98/24985 (22) International Filing Date: 19 November 1998 (19.11.98) (30) Priority Data: 08/975,091 20 November 1997 (20.11.97) US (71) Applicant: ERICSSON INC. [US/US]; 7001 Development Drive, P.O. Box 13969, Research Triangle Park, NC 27709 (US). (72) Inventor: KASIVISWANATHAN, Rangarajan; 2819 North Shiloh #211W, Garland, TX 75044 (US). (74) Agents: MOORE, Stanley, R. et al.; Jenkins & Gilchrist, P.C., Suite 3200, 1445 Ross Avenue, Dallas, TX 75202 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: SYSTEM, METHOD AND APPARATUS FOR DIRECT VOICE MAIL ACCESS AND BLOCKING

(57) Abstract

A telecommunications system and method is disclosed for enabling a calling subscriber to invoke the forwarding of a call to a voice mail system for the called subscriber on a call-by-call basis in order to leave a message for the called subscriber without disturbing (ringing) the called subscriber. The associated disadvantage with this "Direct Voice Mail Access" (DVMA) feature is that the called party will lose control over his/her call forwarding to voice mail feature for that particular call. Therefore, in order to overcome this disadvantage, another feature, "Direct Voice Mail Access Blocking" (DVMAB) can be implemented to allow the called subscriber to inhibit direct access to their voice mail by the calling subscriber.



BEST AVAILABLE COPY

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

-1-

## SYSTEM, METHOD AND APPARATUS FOR DIRECT VOICE MAIL ACCESS AND BLOCKING

### BACKGROUND OF THE PRESENT INVENTION

#### 5        Field of the Invention

The present invention relates generally to telecommunications systems and methods for routing calls to voice mail systems, and specifically to enabling a calling subscriber to directly connect to a voice mail system of the called subscriber without ringing the called subscriber and to allowing a called subscriber to prevent a calling  
10       subscriber from directly accessing the called subscribers voice mail system.

#### Background and Objects of the Present Invention

Since the beginning of the telephone in the 1870's, signaling has been an integral part of telephone communications. Such signaling typically includes the call setup, such as ringing the called party, and tear-down procedures. In modern  
15       telecommunications networks, signaling constitutes the distinct control infrastructure that enables provision of all other services. It can be defined as the system that enables stored program control exchanges, network databases, and other "intelligent" nodes of the network to exchange: (a) messages related to call setup, supervision, and tear-down; (b) information needed for distributed applications processing (inter-process  
20       query/response); and (c) network management information.

In addition, the Intelligent Network (IN) and the new Advanced Intelligent Network (AIN) have made possible the transfer of all types of information through the telephone network without special circuits or long installation cycles. In the IN, everything is controlled or configured by workstations with user-friendly software.  
25       Telephone service representatives can, therefore, create new services and tailor a subscriber's service from a terminal while talking with the customer. These changes are immediately and inexpensively implemented in the switches, rather than by the more traditional method: expensive programming changes made by certified technicians.

-2-

The IN consists of a series of intelligent nodes, each capable of processing at various levels, and each capable of communicating with one another over data links. Currently, the IN relies on the Signaling System #7 (SS7) network, which provides the basic infrastructure needed for the various signaling points in the IN. SS7, in turn,  
5 relies on Common Channel Signaling, which uses a digital facility, but places the signaling information in a time slot or channel separate from the voice and data to which it is related. This allows signaling information to be consolidated and sent through its own network apart from the voice network.

The various signaling points in the IN both perform message discrimination  
10 (read the address and determine if the message is for that node), and route messages to other signaling points. The basic three types of signaling points are: (1) Service Switching Points (SSPs); (2) Signal Transfer Points (STPs); and (3) Service Control Points (SCPs), each of which are described in more detail hereinafter.

With reference now to FIGURE 1 of the drawings, the many Service Switching  
15 Points (SSPs) 100 serve as the local exchanges in a telephone network 90, a portion of which is shown in FIGURE 1. The SSPs 100 preferably provide an Integrated Services Digital Network (ISDN) interface for the Signal Transfer Points (STPs) 110, as is understood in the art. The signaling information is handed off to the SS7 network and transferred to an end office (another SSP) using SS7 ISDN User Part (ISUP)  
20 protocol, which is responsible for all call setup and tear down.

The STP 110 serves as a router, and switches messages received from a particular SSP 100 through the network 90 to their appropriate destinations (another SSP 100). As is also understood in the art, the STP 110 receives messages in packet form from the SSPs 100. These packets are either related to call connections or  
25 database queries. If the packet is a request to connect a call, the message must be forwarded to a destination end office (another SSP 100), where the call will be terminated.

If, however, the message is a database query seeking additional information, the destination will be a database. Database access is provided through the Service  
30 Control Point (SCP) 120, which does not store the information, but acts as an interface to a computer that houses the requested information, as is understood in the art.

-3-

Local service providers (SSPs) are currently providing centralized voice mail systems to subscribers as a substitute for individual answering machines. Increasingly, subscribers are opting for these centralized voice mail systems due to the flexibilities that they provide. In addition, most business group subscribers have voice mail systems implemented within their offices. Voice mail is provided to subscribers using one of the variants of a call forwarding feature, which is understood in the art. Typically, the called subscriber is assigned a "Call Forwarding Don't Answer" (CFD) feature and "Call Forwarding Busy" (CFB) feature, which will allow the call to be forwarded to the called subscriber's voice mail. Thus, the call will be forwarded to the called subscriber's voice mail if either the called subscriber does not answer the call or the called subscriber's line is busy.

In some cases, a calling subscriber may wish to leave a voice mail message for the called subscriber without disturbing the called subscriber. Existing technology allows a voice mail to be accessed only using call forwarding features without any control by the calling subscriber as to when the call forwarding feature is invoked. However, if the called subscriber is on the same voice mail system as the calling subscriber, the voice mail system may provide the ability to leave a message without disturbing the called subscriber.

Unfortunately, if the calling and called subscriber are not on the same voice mail system, it is not possible, at present, to leave a message without ringing the called subscriber, unless the called subscriber has instructed the local service provider to forward all calls directly to the voice mail system without ringing. Once again, this does not allow a calling subscriber to control whether or not the voice mail system should be directly accessed for that call.

In addition, if the voice mail system itself has a separate number associated with it, which can be accessed by a calling subscriber, the calling subscriber typically cannot enter the called subscriber's voice mail box without entering the voice mail box number, listening to the menu to pick up the correct choice, and then leaving a message. This process is cumbersome and inconvenient for a calling subscriber and requires the calling subscriber to remember the called subscriber's voice mail box

-4-

number. In addition, this method of access does not provide any control on the part of the called subscriber to prevent direct voice mail access.

It is therefore an object of the invention to provide direct access by the calling subscriber to the voice mail of the called subscriber without ringing (disturbing) the called subscriber.

It is a further object of the invention to allow the called subscriber to control when a calling subscriber can reach his/her voice mail directly.

#### SUMMARY OF THE INVENTION

The present invention is directed to telecommunications systems and methods for enabling a calling subscriber to invoke the forwarding of a call to a called subscriber to a voice mail system for the called subscriber on a call-by-call basis in order to leave a message for the called subscriber without disturbing the called subscriber. This "Direct Voice Mail Access" (DVMA) feature is particularly useful in business environments where, for example, the calling party either knows the called party is busy or does not have time for a conversation. This feature can also be useful in residential environments where, for example, the calling party needs to leave a message for the called party late at night.

The associated disadvantage with this DVMA feature is that the called party will lose control over his/her call forwarding to voice mail feature for that particular call. Therefore, in order to overcome this disadvantage, another feature, "Direct Voice Mail Access Blocking" (DVMAB) can be implemented to allow the called subscriber to inhibit direct access to their voice mail by the calling subscriber.



-5-

**BRIEF DESCRIPTION OF THE DRAWINGS**

The disclosed invention will be described with reference to the accompanying drawings, which show important sample embodiments of the invention and which are incorporated in the specification hereof by reference, wherein:

5           FIGURE 1 is a block diagram illustrating some of the basic components used in an Intelligent Network or an Advanced Intelligent Network for signal switching;

          FIGURE 2 is a block diagram depicting a sample embodiment of an intra-switch Direct Voice Mail Access system of the present invention;

10           FIGURE 3 illustrates steps in a sample intra-switch Direct Voice Mail Access process of the present invention;

          FIGURE 4 is a block diagram depicting a sample embodiment of an inter-switch Direct Voice Mail Access system of the present invention;

          FIGURE 5 illustrates steps in a sample inter-switch Direct Voice Mail Access process of the present invention;

15           FIGURE 6 is a block diagram depicting a sample embodiment of an intra-switch Direct Voice Mail Access Blocking system of the present invention;

          FIGURE 7 illustrates steps in a sample intra-switch Direct Voice Mail Access Blocking process of the present invention;

20           FIGURE 8 is a block diagram depicting a sample embodiment of an inter-switch Direct Voice Mail Access Blocking system of the present invention; and

          FIGURE 9 illustrates steps in a sample inter-switch Direct Voice Mail Access Blocking process of the present invention.

-6-

**DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EXEMPLARY EMBODIMENTS**

The numerous innovative teachings of the present application will be described with particular reference to the presently preferred exemplary embodiments. However, it should be understood that this class of embodiments provides only a few examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily delimit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others.

“Direct Voice Mail Access” (DVMA) is a feature that provides capability to a calling subscriber to access a voice mail system of a called subscriber without disturbing (ringing) the called subscriber. The DVMA feature can be activated or deactivated by means of subscriber procedures (dialing a service code, such as \*yy). When a subscriber subscribes to DVMA, the local service provider will administer the feature and activate it. Subsequently, if the subscriber who has subscribed to DVMA, wants to deactivate the feature (block the feature), he/she can dial a service code, e.g., \*yy, to deactivate the DVMA feature. To activate the feature, the subscriber can dial another service code, e.g., \*zz, and the feature will be activated. The actual implementation of DVMA varies depending upon whether the calling and called subscribers are within the same switch.

With reference now to FIGURE 2 of the drawings, in the case where both the calling subscriber, hereinafter referred to as Subscriber A 200, and the called subscriber, hereinafter referred to as Subscriber B 220, are within the same Switch 210 (local service provider, Service Switching Point (SSP), or end office), intra-switch DVMA can be implemented. If Subscriber B 200 has subscribed to the voice mail service 240 provided by Switch 210, Switch 210 then assigns a new subscriber category, Voice Mail Access (VMA) 230, to Subscriber B 220 to indicate that calls not received by Subscriber B 220 will be forwarded to Subscriber B's voice mail box 250 within the voice mail system 240.

As shown in FIGURE 3 of the drawings, which will be described in connection with FIGURE 2 of the drawings, steps in a sample intra-switch utilization of the DVMA feature of the present invention are illustrated in which Subscriber A 200 first



-7-

dials the service code for DVMA, e.g., \*xx, followed by Subscriber B's 220 number (step 300). Thereafter, Switch 210 analyzes the DVMA service code entered by Subscriber A 200 (step 305), and sets an indicator associated with the call to "DVMA requested" (step 310).

5           Switch 210 then determines that Subscriber B 220 resides in the same switch 210 as Subscriber A 200 (step 315) and ascertains whether Subscriber B 220 has a voice mail feature (step 325), e.g., by checking the VMA category 230 associated with Subscriber B 220. If Subscriber B 220 has the voice mail feature (step 325), e.g., the VMA category 230 is set to "yes", Switch 210 changes the "Call Forwarding Don't  
10   Answer" (CFD) feature 225, which routes the call to the called subscribers voice mail system 240 when the called subscriber 220 does not answer the call, to a "Call Forwarding Variable" (CFV) feature 235 (step 330), which routes the call directly to the called subscribers voice mail box 250 for this particular call. This CFV feature 235 is typically used by a called subscriber (Subscriber B 220) to instruct Switch 210  
15   to forward all calls directly to the voice mail system 240 without ringing. However, with the present invention, Subscriber A 200 is allowed to control when to directly access Subscriber B's voice mail box 250.

---

20           However, if the voice mail feature 230 is either not assigned to Subscriber B 220 or is inactive (step 325), an announcement will be played to Subscriber A 200 stating that DVMA is not available (step 335), and the call will be torn down without being set up (step 340).

25           After changing the call forwarding category for the call (step 330), a call connection is established between Subscriber A 200 and Subscriber B 220 (step 345). At seizure, the call will encounter CFV 235 (step 350) and the call will be forwarded to Subscriber B's voice mail box 250 within the voice mail system 240 (step 355). Advantageously, Subscriber B 220 will not be disturbed (except for a ping ring, e.g., one-fourth of a ring) and the voice mail system 240 can then be directly accessed by Subscriber A 200.

30           For inter-switch DVMA, as shown in FIGURE 4 of the drawings, in which Subscriber A 400 and Subscriber B 430 are served by two separate switches (Switch A 410 and Switch B 420 respectively), Switch A 410 and Switch B 420 must be

-8-

connected by SS7 signaling in order to route the appropriate messages, which carry instructions regarding the DVMA feature, between the switches.

As indicated in FIGURE 4 of the drawings, Subscriber B 430 has been assigned the Call Forwarding Don't Answer (CFD) and Call Forwarding Busy (CFB) 5 432 features, which enable calls that either are not answered by Subscriber B 430 or which encounter a "busy" signal to be routed to Subscriber B's voice mail box 450 within the voice mail system 440. Furthermore, Subscriber B 430 has also been assigned the new category Voice Mail Access (VMA) 435 to indicate that Subscriber B 430 is connected to a voice mail service 440. The two switches (Switch A 410 and 10 Switch B 420) are connected by Integrated Service Digital Network (ISDN) User Part (ISUP) trunks 415 and utilize ISDN User Part (ISUP) protocols to send messages between the switches.

With reference now to FIGURE 5 of the drawings, which will be described in connection with FIGURE 4 of the drawings, steps in a sample implementation of the 15 inter-switch DVMA feature of the present invention are illustrated in which Subscriber A 400 first dials the service code for DVMA, e.g., \*xx, followed by Subscriber B's 430 number (step 500). Thereafter, Switch A 410 analyzes the DVMA service code entered by Subscriber A 400 (step 505), and sets an indicator associated with the call to "DVMA requested" (step 510).

20 Switch A 410 then performs B-number analysis, as is understood in the art, on Subscriber B's 430 number and determines that Subscriber B 430 does not reside in Switch A 410 (step 515). Thereafter, Switch A 410 checks whether there is an ISUP link 415 between Switch A 410 and Switch B 420 (step 520). If such a link 415 is available (step 520), Switch A sends a "Service Activation Parameter" with a "Feature 25 Code" coded as a "DVMA request" in the Initial Address Message (IAM), along with other information, to Switch B 420 (step 525). Upon receiving the IAM, Switch B 420 processes the call normally, as is well known in the art, by ascertaining whether Subscriber B 430 has purchased a voice mail feature (step 535), e.g., by checking the VMA category 435 associated with Subscriber B 430.

30 If Subscriber B 430 has the voice mail feature (step 535), e.g., the VMA category 435 is set to "yes", Switch B 420 changes the "Call Forwarding Don't

-9-

Answer" (CFD) feature 432, which routes the call to the called subscribers voice mail system 440 when the called subscriber 430 does not answer the call, to a "Call Forwarding Variable" (CFV) feature 438 (step 540), which routes the call directly to the called subscribers voice mail box 450 for this particular call.

5           However, if the voice mail feature 435 is either not assigned to Subscriber B 430 or is inactive (step 535), Switch B 420 will respond to Switch A 410 with a "Service Activation" parameter in an Address Complete Message (ACM) or Answer Message (ANM) with a "Feature Code" of "DVMA not available" (step 545). Thereafter, an announcement will be played to Subscriber A 400 stating that DVMA  
10 is not available (step 550), and the call will be torn down without being set up (step 555).

          After changing the call forwarding category for the call (step 540), a call connection can then be established between Subscriber A 400 and Subscriber B 430 (step 560). At seizure, the call will encounter the CFV feature 438 (step 565) and the  
15 call will be forwarded to Subscriber B's voice mail box 450 within the voice mail system 440 (step 570) without disturbing (ringing) Subscriber B.

          "Direct Voice Mail Access Blocking" (DVMAB) is a feature that provides the capability to a called subscriber to block the "Direct Voice Mail Access" of the calling subscriber. Increasingly, centralized voice mail services are being offered by local  
20 telephone companies. DVMA can be used when a calling party wishes to leave a message to the voice mail of the called subscriber without disturbing (ringing) the called subscriber. Unfortunately, with the DVMA feature, the called subscriber will not have any control over when the calling party will be able to directly access the called subscribers voice mail. Therefore, DVMAB will provide that control to the  
25 called subscriber to allow the called subscriber to block the DVMA feature. However, the actual implementation of the DVMAB feature will vary depending upon whether the calling and called subscribers are within the same switch or not.

          With reference now to FIGURE 6 of the drawings, in the situation where the calling subscriber (hereinafter referred to as Subscriber A 600) and the called  
30 subscriber (hereinafter referred to as Subscriber B 620) are within the same switch (Switch 610), which provides voice mail service 640 to Subscriber B 620, a new

-10-

subscriber category, "Voice Mail Blocking" (VMB) 625, can be assigned to Subscriber B 620 to indicate that Subscriber B 620 is forwarded to voice mail 640 for the situations where the CFD and CFB features 622 are initiated, but direct access to voice mail 640 is blocked. Alternatively, Subscriber B 620 can activate the DVMAB feature 625 by dialing a service code, e.g., \*yy for DVMAB 625. Thereafter, Switch 610 can analyze the DVMAB service code entered by Subscriber B 620 and assign the VMB category 625 to Subscriber B 620. Subsequently, if Subscriber B 620 wants to deactivate the DVMAB feature 625 (block the feature), he/she can dial a service code, e.g., \*zz, to deactivate the DVMAB feature 625.

10 As shown in FIGURE 7 of the drawings, which will be described in connection with FIGURE 6 of the drawings, steps in a sample intra-switch utilization of the DVMAB feature 625 of the present invention are illustrated in which Subscriber A 600 first dials the service code for DVMA, e.g., \*xx, followed by Subscriber B's 620 number (step 700). Thereafter, Switch 610 analyzes the DVMA service code entered by Subscriber A 600 (step 705), and sets an indicator associated with the call to "DVMA requested" (step 710). Switch 610 then determines that Subscriber B 620 resides in the same switch (Switch 610) as Subscriber A 600 (step 715).

Switch 610 then ascertains whether Subscriber B 620 has purchased a voice mail feature (step 725), e.g., by checking the VMA category 630 associated with Subscriber B 620. If Subscriber B 620 has the voice mail feature (step 725), e.g., the VMA category 630 is set to "yes", and if DVMAB is not activated (VMB is not enabled) (step 730), Switch 610 changes the "Call Forwarding Don't Answer" (CFD) feature 622, which routes the call to the called subscribers voice mail system 640 when the called subscriber 620 does not answer the call, to a "Call Forwarding Variable" (CFV) feature 635 (step 735), which routes the call directly to the called subscribers voice mail 640 for this particular call (step 740).

However, if the voice mail feature 630 is either not assigned to Subscriber B 600 or is inactive (step 725), or if DVMAB is activated (VMB is enabled) (step 730), an announcement will be played to Subscriber A 600 stating that DVMA is not available (step 745), and the call will be torn down, as is understood in the art, without being set up (step 750).

-11-

For inter-switch DVMAB, as shown in FIGURE 8 of the drawings, in which Subscriber A 800 and Subscriber B 830 are served by two separate switches (Switch A 810 and Switch B 820 respectively), Switch A 810 and Switch B 820 must be connected by SS7 signaling in order to route the appropriate messages, which carry instructions regarding the DVMA feature, between the switches.

As indicated in FIGURE 8 of the drawings, Subscriber B 830 has been assigned the Call Forwarding Don't Answer (CFD) and Call Forwarding Busy (CFB) features 832, which enable calls that either are not answered by Subscriber B 830 or which encounter a "busy" signal to be routed to Subscriber B's voice mail 840. Furthermore, Subscriber B 830 has also been assigned the new category "Voice Mail Blocking" (VMB) 835 to indicate that Subscriber B 830 is connected to a voice mail service 840, but direct access to voice mail 840 is blocked. The two switches (Switch A 810 and Switch B 820) are connected by Integrated Service Digital Network (ISDN) User Part (ISUP) routes 815 and utilize ISDN User Part (ISUP) protocols to send messages between the switches (810 and 830).

With reference now to FIGURE 9 of the drawings, which will be described in connection with FIGURE 8 of the drawings, steps in a sample implementation of the inter-switch DVMAB feature 835 of the present invention are illustrated in which Subscriber A 800 first dials the service code for DVMA, e.g., \*xx, followed by Subscriber B's 830 number (step 900). Thereafter, Switch A 810 analyzes the DVMA service code entered by Subscriber A 800 (step 905), and sets an indicator associated with the call to "DVMA requested" (step 910).

Switch A 810 then determines that Subscriber B 830 does not reside in Switch A 810 (step 915) and checks whether there is an ISUP link 815 between Switch A 810 and Switch B 820 (step 920). If such a link 815 is available (step 920), Switch A 810 sends a "Service Activation Parameter" with a "Feature Code" coded as a "DVMA request" in the Initial Address Message (IAM), along with other information, to Switch B 820 (step 925). Upon receiving the IAM, Switch B 820 processes the call normally, as is well known in the art, by ascertaining whether Subscriber B 830 has purchased a voice mail feature 828 (step 930), e.g., by checking the VMA category 828 associated with Subscriber B 830.



-12-

If Subscriber B 830 has the voice mail feature 828 (step 930), e.g., the VMA category 828 is set to "yes", and DVMAB is not activated (VMB is not enabled) (step 935), Switch B 820 changes the "Call Forwarding Don't Answer" (CFD) feature 832, which routes the call to the called subscribers voice mail system 840 when the called subscriber 830 does not answer the call, to a "Call Forwarding Variable" (CFV) feature 838 (step 940), which can then route the call directly to the called subscribers voice mail box 850 within the voice mail system 840 for this particular call (step 945).

However, if the voice mail feature 838 is either not assigned to Subscriber B 830 or is inactive (step 930), or if DVMAB is activated (VMB is enabled) (step 935), Switch B 820 will respond to Switch A 810 with a "Service Activation" parameter in an Address Complete Message (ACM) or Answer Message (ANM) with a "Feature Code" of "DVMA not available" (step 950). Thereafter, an announcement will be played to Subscriber A 800 stating that DVMA is not available (step 955), and the call will be torn down, as is understood in the art, without being set up (step 960).

In an alternative embodiment of the present invention, also shown in FIGURE 8 of the drawings, an extended version of DVMAB, selective DVMAB, can be used by Subscriber B 830 to indicate the specific calling subscribers either allowed or not allowed to directly access Subscriber B's voice mail system 840. Subscriber B 830 can create a list 860 of directory numbers, using subscriber procedures, e.g., dialing a service code, followed by a directory number to add a number to the list or delete a number from the list 860. With selective DVMAB, when Subscriber A 800 initiates a call to Subscriber B's voice mail system 840 directly, prior to connecting Subscriber A 800 to Subscriber B's voice mail box 850, Switch B 830 checks Subscriber A's 800 number against the list 860 of allowed or disallowed numbers. If Subscriber A's 800 number is not available, or if Subscriber A 800 is restricted from directly accessing Subscriber B's voice mail 850, according to the list 860, rejection treatment is applied to Subscriber A 800.

Advantageously, the DVMA and DVMAB features are particularly useful in business environments where the calling party has the ability to leave a message without disturbing the called party and the called party can control when to block this



-13-

direct access to voice mail. These features are also useful in residential environments where the calling party needs to leave a message for the called subscriber late at night.

As will be recognized by those skilled in the art, the innovative concepts described in the present application can be modified and varied over a wide range of applications. Accordingly, the scope of patented subject matter should not be limited to any of the specific exemplary teachings discussed.

-14-

**WHAT IS CLAIMED IS:**

1. A telecommunication system for enabling a calling subscriber to place a call directly to a voice mail box associated with a called subscriber without ringing said called subscriber, said telecommunications system comprising:
  - 5 at least one switch for connecting said call from said calling subscriber to said called subscriber, said calling subscriber dialing a service code associated with a Direct Voice Mail Access feature, said switch receiving said service code; and
  - a voice mail system attached to said switch, said voice mail box associated with said called subscriber being located within said voice mail system, said switch
  - 10 connecting said call to said voice mail box associated with said called subscriber when said service code associated with said Direct Voice Mail Access feature is dialed by said calling subscriber.
2. The telecommunications system of Claim 1, wherein said switch is a
- 15 service switching point.
3. The telecommunications system of Claim 1, wherein said called
- subscriber has a Call Forwarding Don't Answer feature associated therewith.
4. The telecommunications system of Claim 3, wherein said calling
- 20 subscriber and said called subscriber are served by said switch.
5. The telecommunications system of Claim 4, wherein said Call
- Forwarding Don't Answer feature associated with said called subscriber is changed to
- 25 a Call Forwarding Variable feature when said calling subscriber dials said service code associated with said Direct Voice Mail Access feature, said call being connected by said switch directly to said voice mail box associated with said called subscriber, without ringing said called subscriber.

-15-

6. The telecommunications system of Claim 3, wherein said called subscriber is served by said switch and said calling subscriber is served by an additional switch.

5

7. The telecommunications system of Claim 6, wherein said switch associated with said called subscriber and said additional switch associated with said calling subscriber are connected by Integrated Service Digital Network User Part trunks and utilize SS7 signaling to send messages therebetween.

10

8. The telecommunications system of Claim 6, wherein said Call Forwarding Don't Answer feature associated with said called subscriber is changed to a Call Forwarding Variable feature when said calling subscriber dials said service code associated with said Direct Voice Mail Access feature, said call being connected by said switch associated with said called subscriber, directly to said voice mail box associated with said called subscriber, without ringing said called subscriber.

15

9. The telecommunications system of Claim 8, wherein said call is connected to said voice mail box associated with said called subscriber by said additional switch associated with said calling subscriber sending a Feature Code coded as a Direct Mail Voice Access request in a Service Activation parameter within an Initial Address Message to said switch associated with said called subscriber.

20

10. The telecommunications system of Claim 6, wherein said call is not routed to said voice mail box associated with said called subscriber when a voice mail feature associated with said called subscriber is not activated.

25

11. The telecommunications system of Claim 10, wherein said switch associated with said called subscriber sends to said additional switch associated with said calling subscriber a Feature Code coded as Direct Voice Mail Access unavailable

30

-16-

in a Service Activation parameter in a message when said voice mail feature associated with said called subscriber is not activated.

5           12.    The telecommunications system of Claim 11, wherein said message is an Address Complete Message.

          13.    The telecommunications system of Claim 11, wherein said message is an Answer Message.

10           14.    The telecommunications system of Claim 11, wherein an announcement indicating said Direct Voice Mail Access feature is not available is played to said calling subscriber when said voice mail feature associated with said called subscriber is not activated.

15           15.    The telecommunications system of Claim 1, wherein said called subscriber has a Direct Voice Mail Access Blocking feature associated therewith.

20           16.    The telecommunications system of Claim 15, wherein said called subscriber activates said Direct Voice Mail Access Blocking feature by entering a service code associated with said Direct Voice Mail Access Blocking feature.

25           17.    The telecommunications system of Claim 15, wherein said switch does not connect said call from said calling subscriber to said voice mail box associated with said called subscriber when said Direct Voice Mail Access Blocking feature is activated.

30           18.    The telecommunications system of Claim 17, wherein an announcement indicating said Direct Voice Mail Access feature is not available is played to said calling subscriber when said Direct Voice Mail Access Blocking feature associated with said called subscriber is activated.

-17-

19. A method for placing a call from a calling subscriber directly to a voice mail box associated with a called subscriber without ringing said called subscriber, said method comprising the steps of:

5 entering, by said calling subscriber, a service code associated with a Direct Voice Mail Access feature and a number associated with said called subscriber to place said call;

receiving, by at least one switch, said service code and said number, said switch serving said called subscriber, said voice mail box being located within a voice mail system attached to said switch; and

10 connecting said call from said calling subscriber to said voice mail box associated with said called subscriber, through said switch.

20. The method of Claim 19, wherein said switch is a service switching point.

15

21. The method of Claim 19, wherein said called subscriber has a Call Forwarding Don't Answer feature associated therewith.

22. The method of Claim 21, wherein said calling subscriber and said  
20 called subscriber are served by said switch.

23. The method of Claim 22, further comprising, after said step of entering said service code and said number, the step of:

25 changing said Call Forwarding Don't Answer feature associated with said called subscriber to a Call Forwarding Variable feature to connect said call, by said switch, directly to said voice mail box associated with said called subscriber, without ringing said called subscriber.

24. The method of Claim 21, wherein said called subscriber is served by  
30 said switch and said calling subscriber is served by an additional switch.

-18-

25. The method of Claim 24, wherein said switch associated with said called subscriber and said additional switch associated with said calling subscriber are connected by Integrated Service Digital Network User Part trunks and utilize SS7 signaling to send messages therebetween.

5

26. The method of Claim 24, further comprising, after said step of entering said service code and said number, the step of:

changing said Call Forwarding Don't Answer feature associated with said called subscriber to a Call Forwarding Variable feature to connect said call, by said switch associated with said called subscriber, directly to said voice mail box associated with said called subscriber, without ringing said called subscriber.

10

27. The method of Claim 26, wherein said step of connecting said call to said voice mail box associated with said called subscriber is performed by said additional switch associated with said calling subscriber sending a Feature Code coded as a Direct Mail Voice Access request in a Service Activation parameter within an Initial Address Message to said switch associated with said called subscriber.

15

28. The method of Claim 24, further comprising, before said step of connecting, the step of:

20

determining, by said switch associated with said called subscriber, if a voice mail feature associated with said called subscriber is activated, said call not being routed to said voice mail box associated with said called subscriber when said voice mail feature associated with said called subscriber is not activated.

25

29. The method of Claim 28, further comprising, after said step of determining, the step of:

30

sending, by said switch associated with said called subscriber, to said additional switch associated with said calling subscriber a Feature Code coded as Direct Voice Mail Access unavailable in a Service Activation parameter in a message when said voice mail feature associated with said called subscriber is not activated.



-19-

30. The method of Claim 29, wherein said message is an Address Complete Message.

31. The method of Claim 29, wherein said message is an Answer Message.

5

32. The method of Claim 29, further comprising, after said step of sending, the step of:

playing, by said additional switch associated with said calling subscriber, an announcement indicating said Direct Voice Mail Access feature is not available to said calling subscriber when said voice mail feature associated with said called subscriber is not activated.

10

33. The method of Claim 19, wherein said called subscriber has a Direct Voice Mail Access Blocking feature associated therewith.

15

34. The method of Claim 33, further comprising, before said step of entering said service code associated with said Direct Voice Mail Access feature, the step of:

activating said Direct Voice Mail Access Blocking feature by said calling subscriber entering a service code associated with said Direct Voice Mail Access Blocking feature.

20

35. The method of Claim 33, further comprising, before said step of connecting, the step of:

determining, by said switch, if said Direct Voice Mail Access Blocking feature associated with said called subscriber is activated, said call from said calling subscriber not being connected, by said switch, to said voice mail box associated with said called subscriber when said Direct Voice Mail Access Blocking feature is activated.

25

30

-20-

36. The method of Claim 35, further comprising, after said step of determining, the step of:

5 playing an announcement indicating said Direct Voice Mail Access feature is not available to said calling subscriber when said Direct Voice Mail Access Blocking feature associated with said called subscriber is activated.

37. A telecommunications switch serving a called subscriber, comprising:  
a voice mail system having a plurality of voice mail boxes therein, a  
given one of said voice mail boxes being associated with said called subscriber;

10 receiving means for receiving a service code associated with a Direct Voice Mail Access feature from a calling subscriber; and

connecting means for connecting a call from said calling subscriber to  
said given voice mail box associated with said called subscriber without ringing said  
called subscriber.

15

38. The telecommunications switch of Claim 37, wherein said calling  
subscriber is served by an additional switch, said switch associated with said called  
subscriber and said additional switch associated with said calling subscriber being  
connected by Integrated Service Digital Network User Part trunks and utilizing SS7  
20 signaling to send messages therebetween.

39. The telecommunications switch of Claim 37, wherein said called  
subscriber has a Direct Voice Mail Access Blocking feature associated therewith, said  
call not being connected to said given voice mail box associated with said called  
25 subscriber when said Direct Voice Mail Access Blocking feature is activated.

1/5

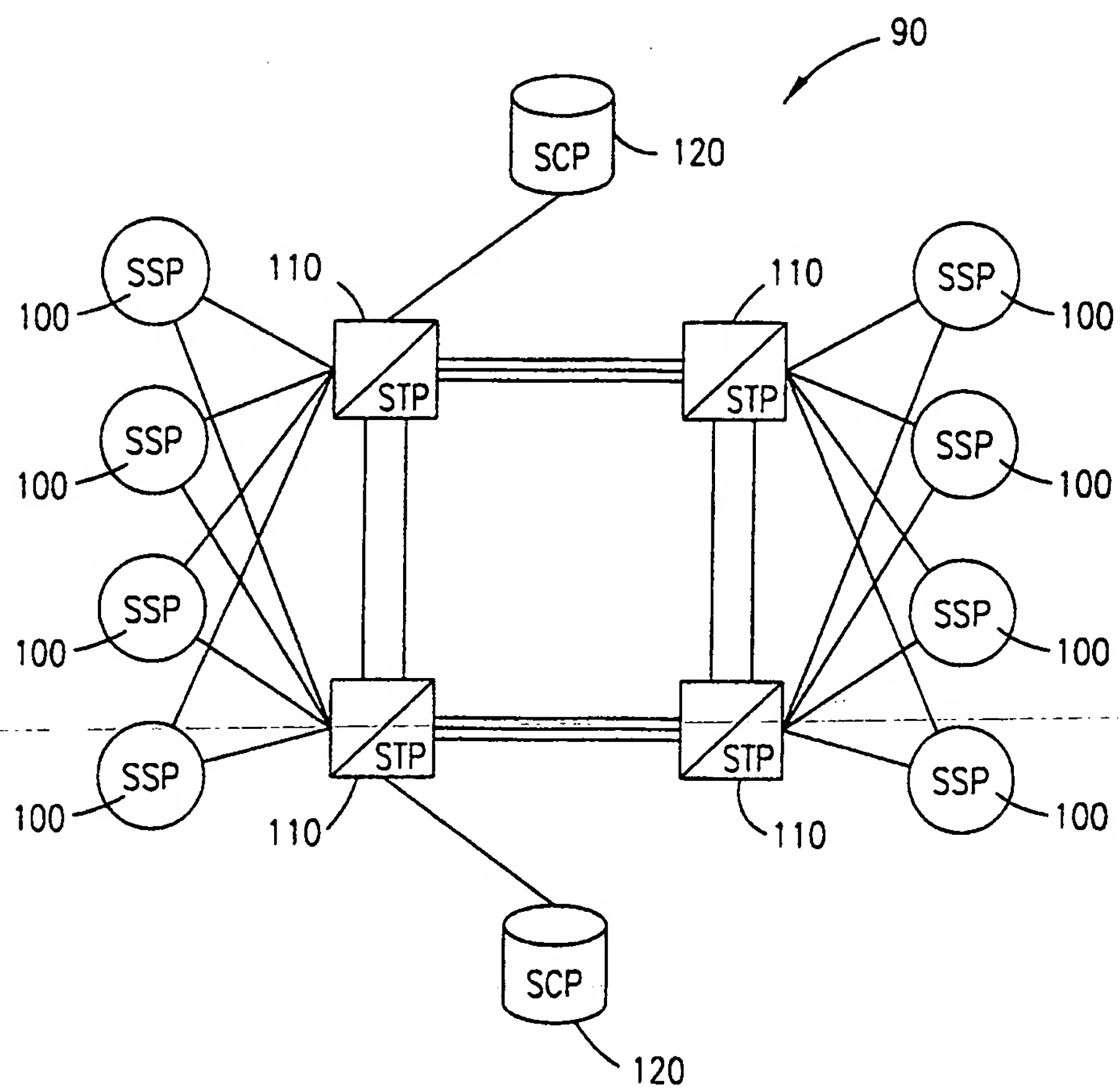
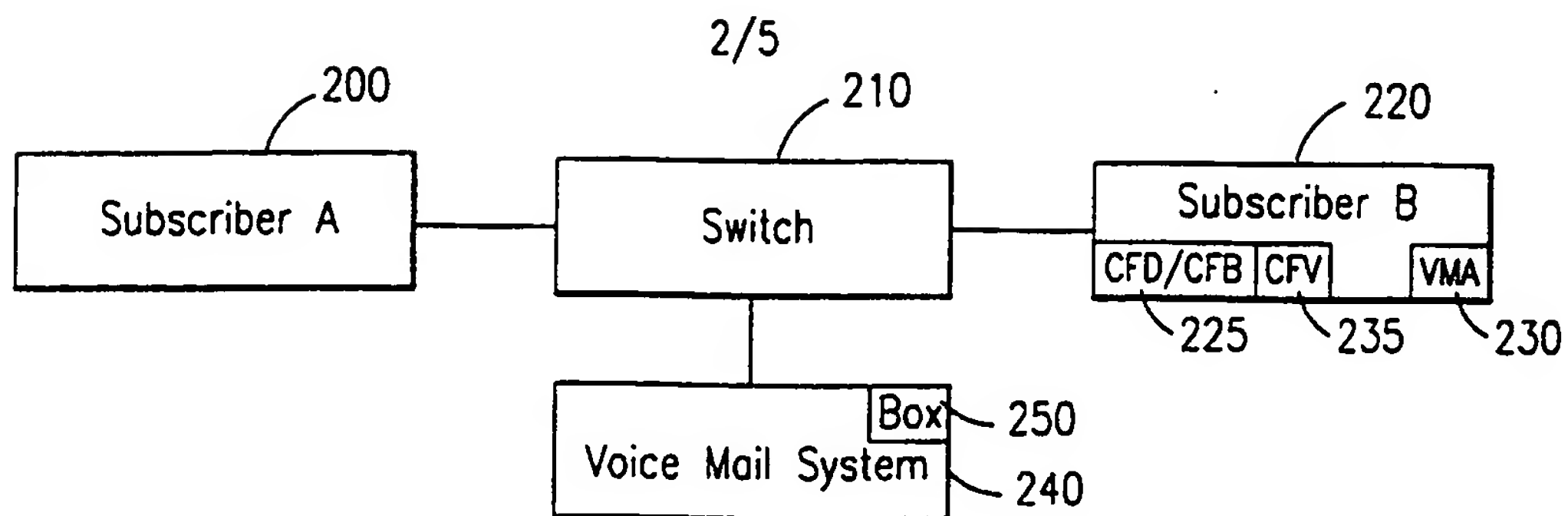
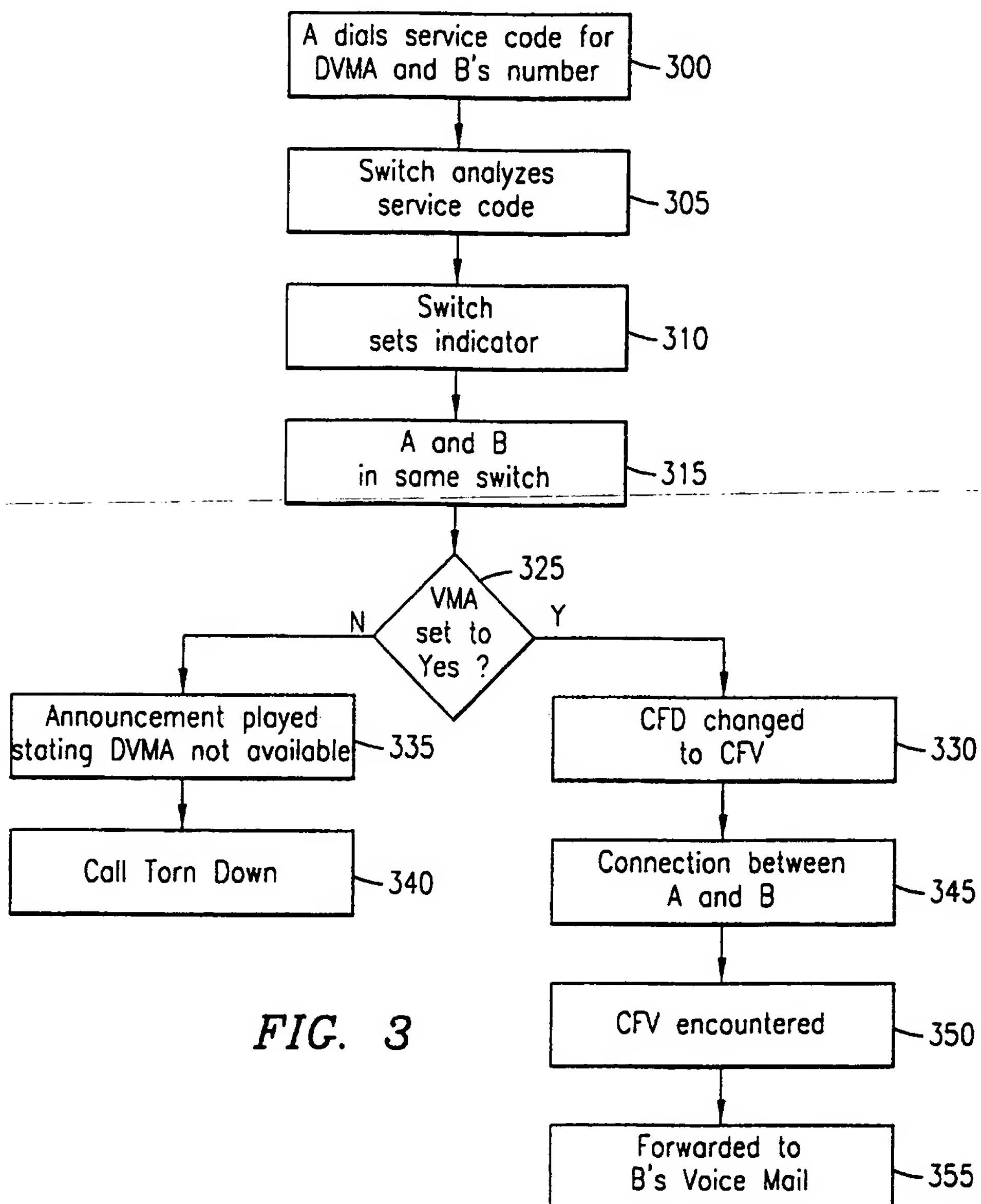
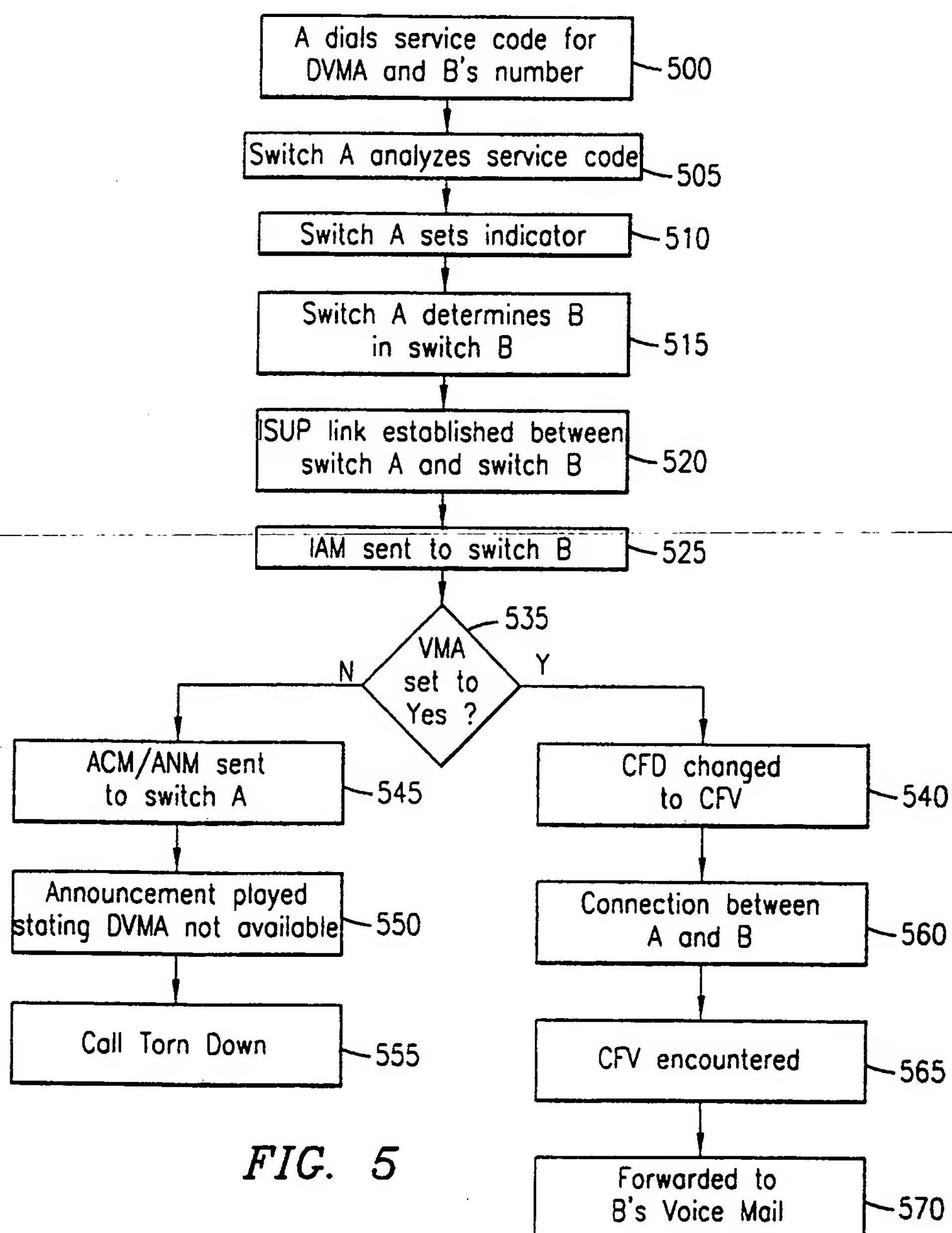
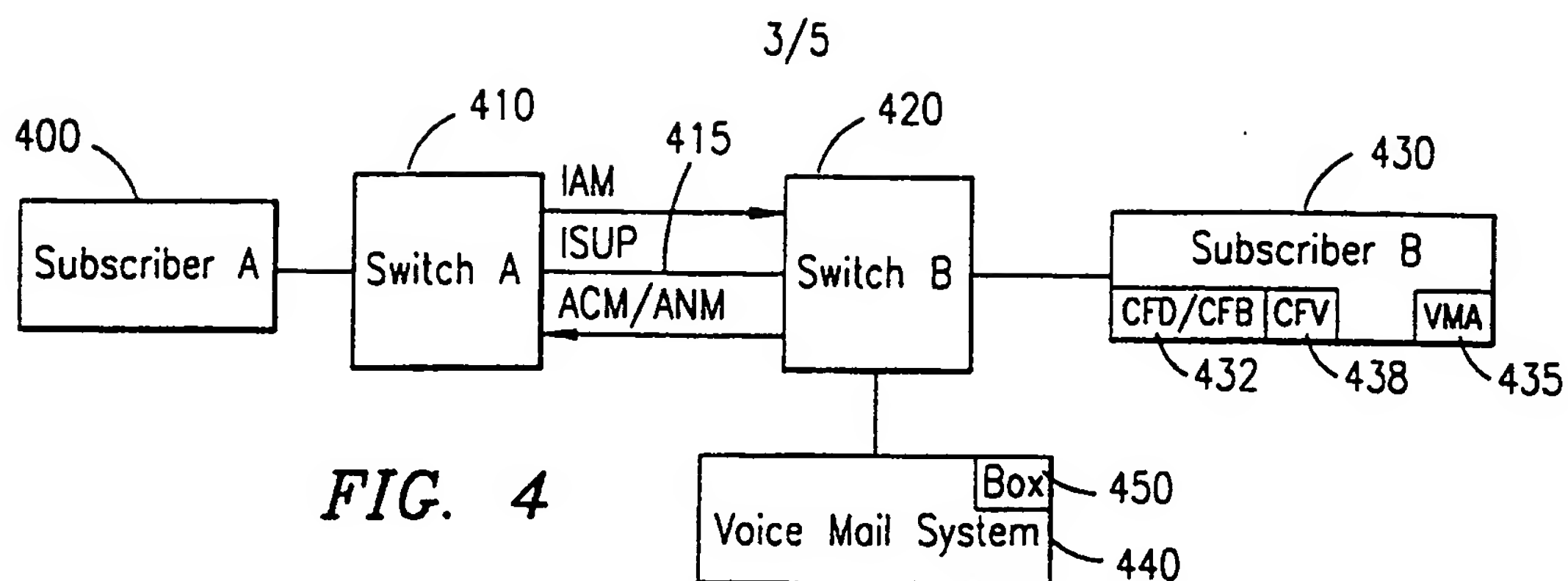


FIG. 1

**FIG. 2**



4/5

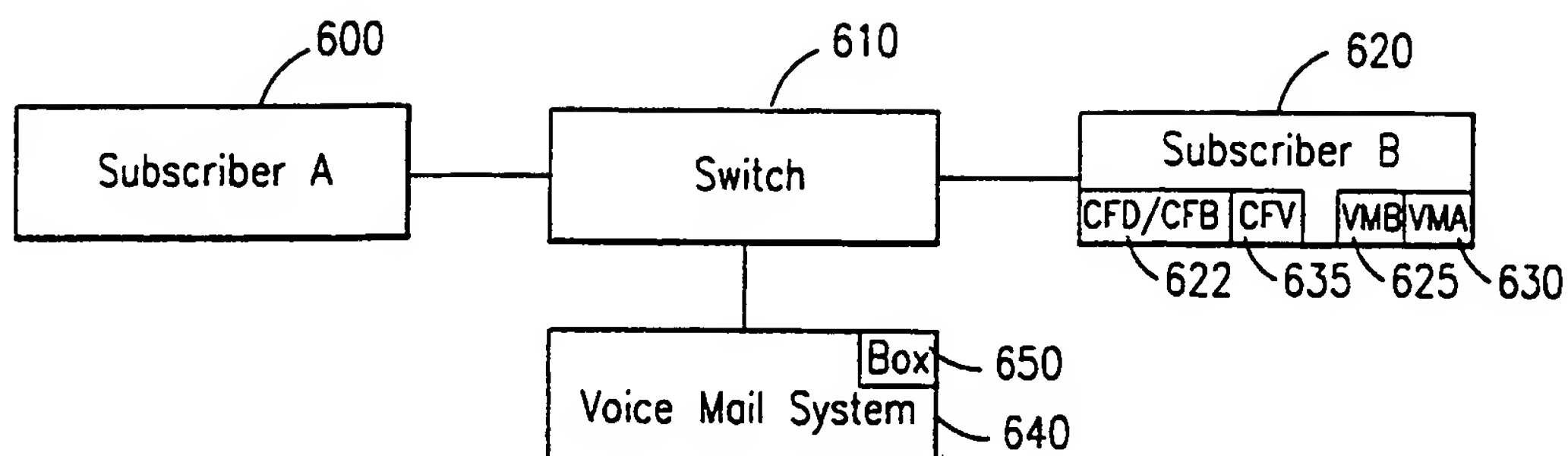


FIG. 6

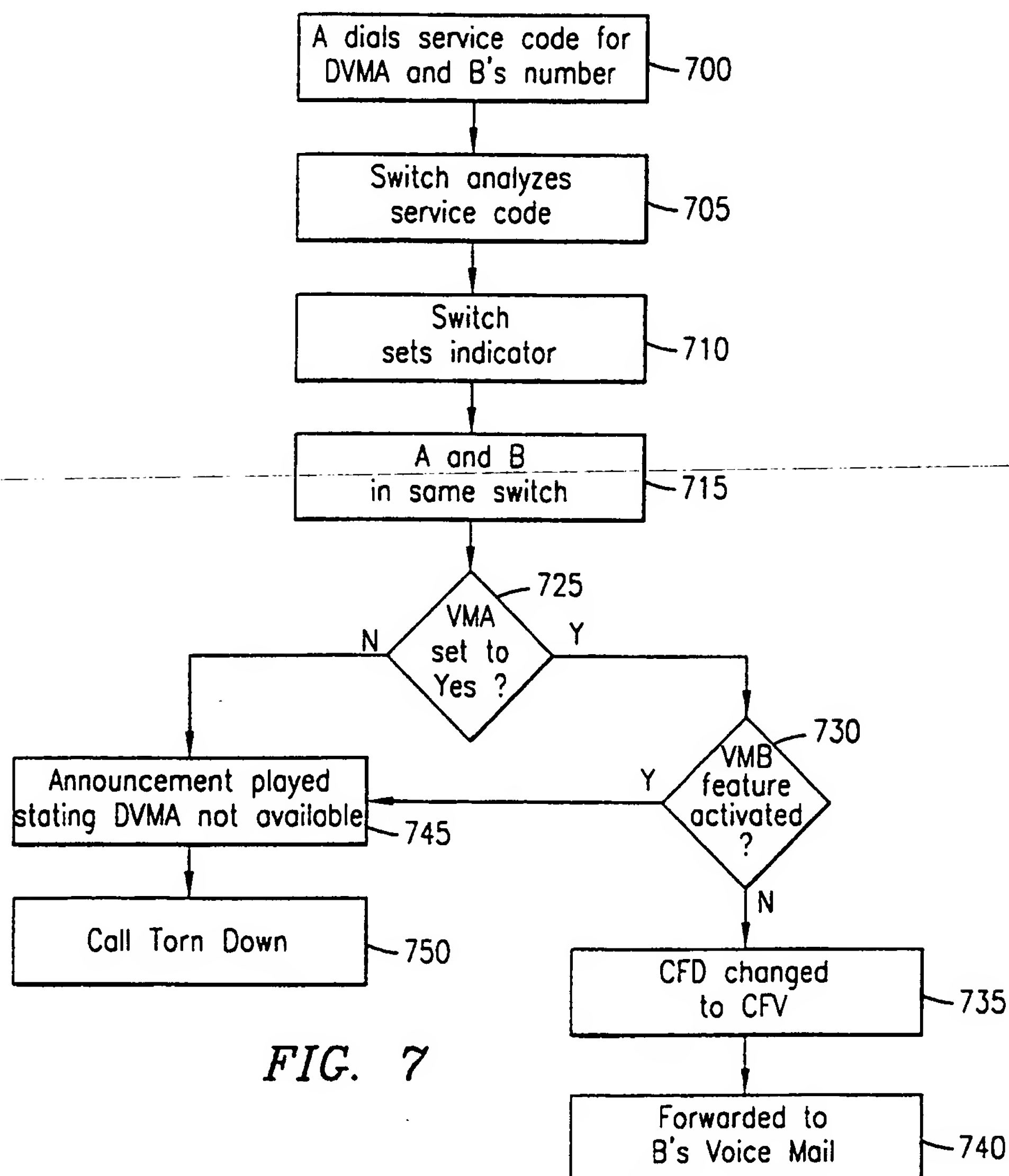
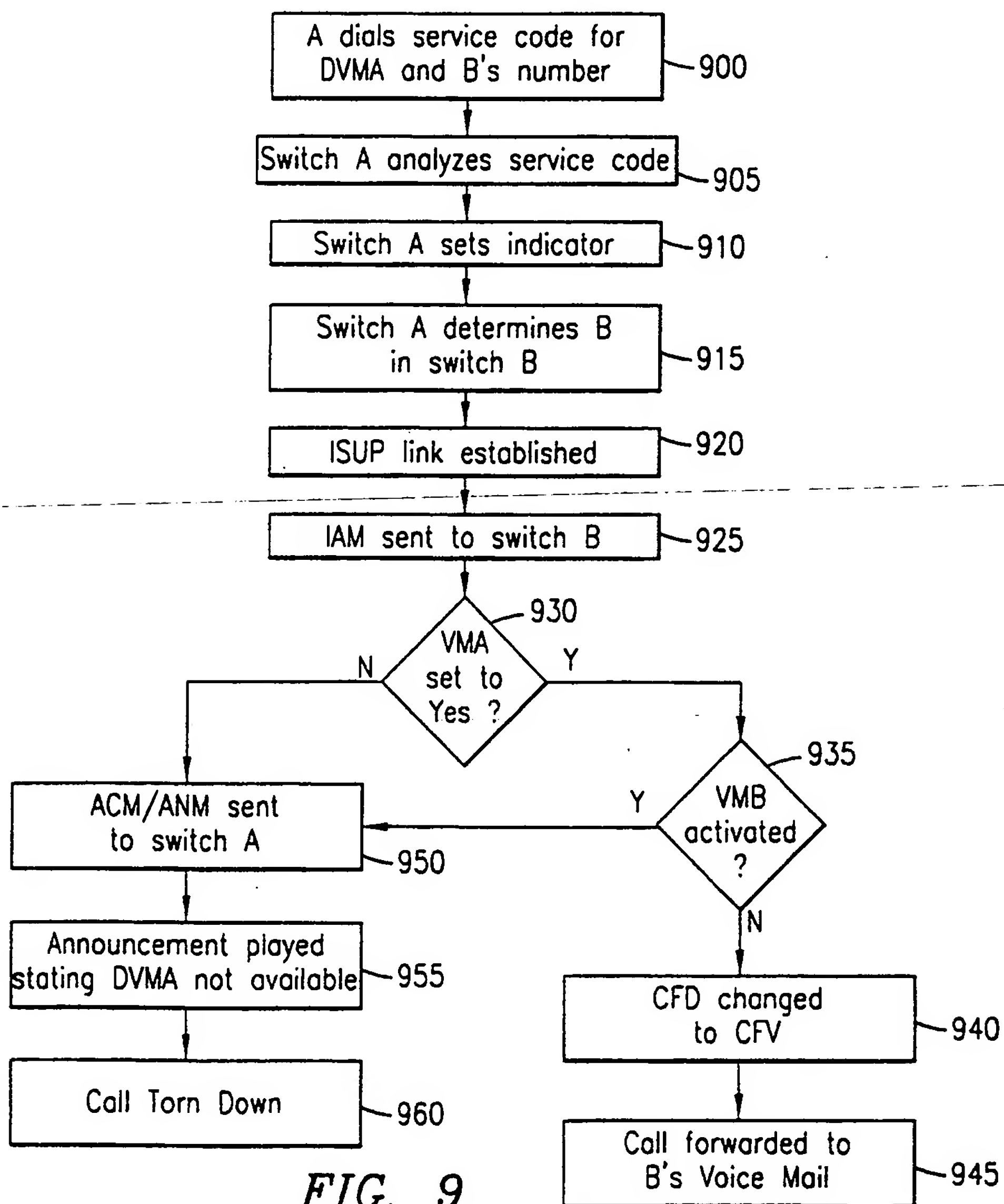
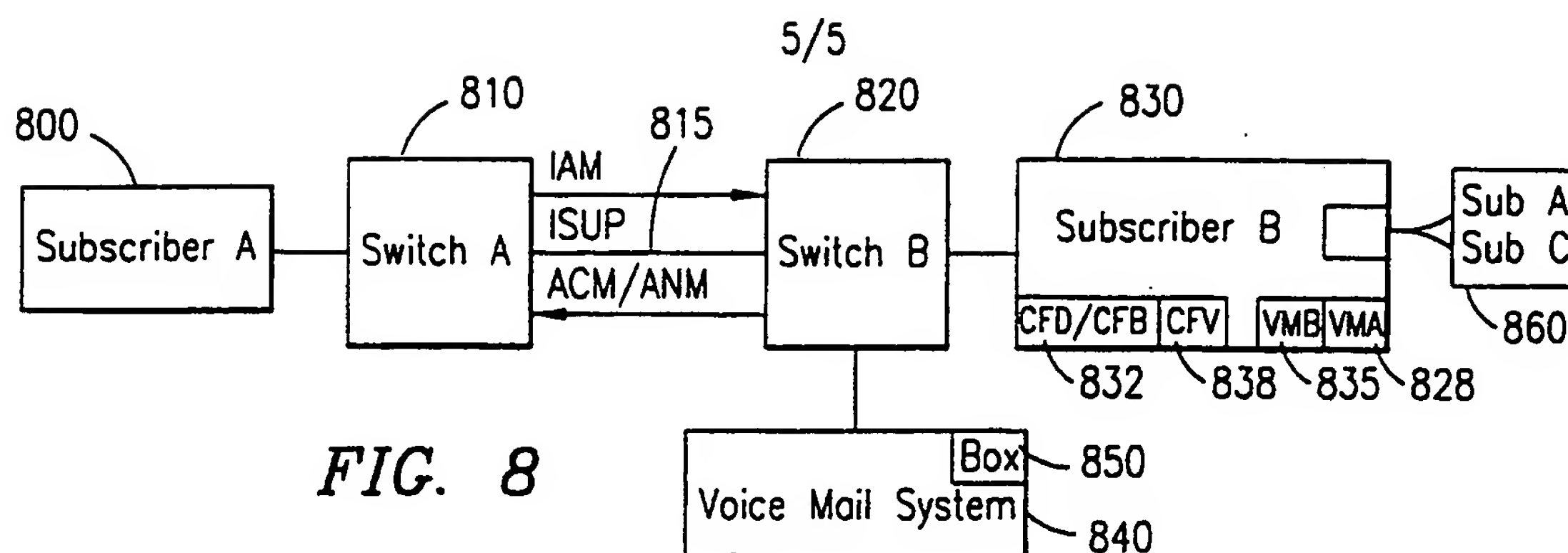


FIG. 7





# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/24985

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 H04M3/50

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 612 416 A (EMERSON WILLIAM D ET AL) 16 September 1986 see column 3, line 58 - column 4, line 12 ---	1-39
A	EP 0 613 278 A (AT & T CORP) 31 August 1994 see column 2, line 2 - line 10 ---	1-39
A	NEWSON C R : "Merlin Voice Mail VM600 " BRITISH TELECOMMUNICATIONS ENGINEERING, vol. 4, April 1985, pages 32-35, XP002098959 see column 1, line 15 - line 19 -----	1-39

☐ Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance  
"E" earlier document but published on or after the international filing date  
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
"O" document referring to an oral disclosure, use, exhibition or other means  
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.  
"&" document member of the same patent family

Date of the actual completion of the international search

8 April 1999

Date of mailing of the international search report

20/04/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Schweitz, M

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

PCT/US 98/24985

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4612416 A	16-09-1986	CA 1244536 A EP 0210221 A WO 8604474 A	08-11-1988 04-02-1987 31-07-1986
EP 0613278 A	31-08-1994	CA 2110352 A,C JP 6276294 A US 5579383 A	27-08-1994 30-09-1994 26-11-1996

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**